WE BELONG TOGETHER

Lab Overview:

Match the 8 function graph cards to the cards that give the corresponding equation, limit information, and description. Then, answer a set of questions based on your matching.

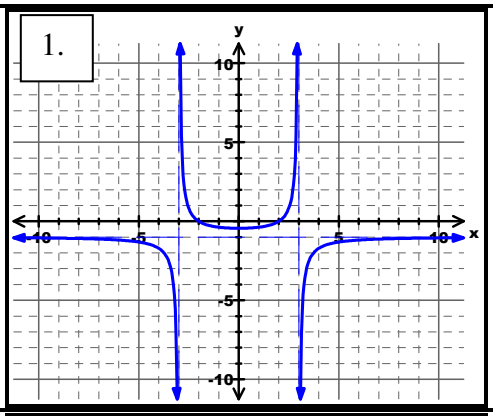
Directions:

- Work in groups of 2-4.
- No graphing calculator or computer may be used.
- Complete the matching and record your answers on the lab sheet.
- Answer the question(s) about each set of cards.

Caution: Although the limit and description cards may apply to more than one of the functions, there is only one way to match the cards so that each set has all 4 components.

GRAPHS

1.



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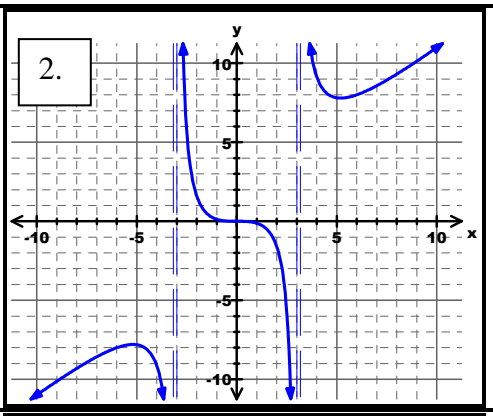
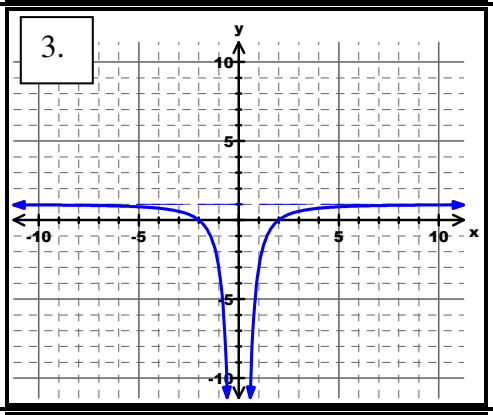


3.



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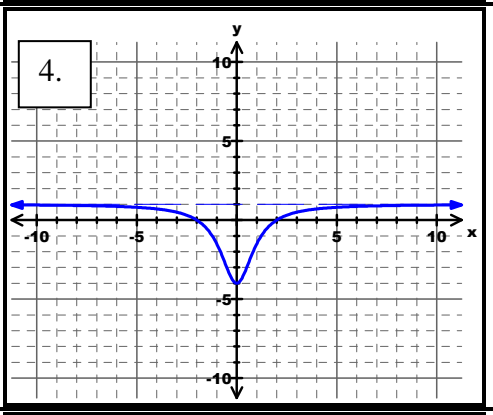

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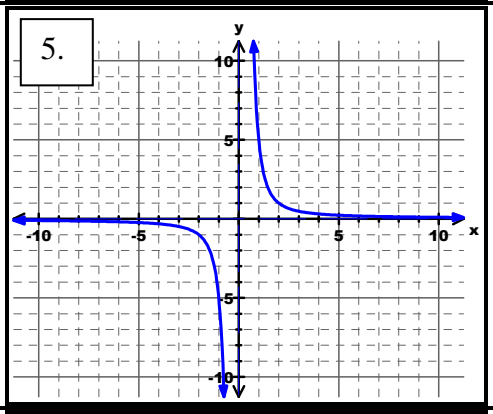

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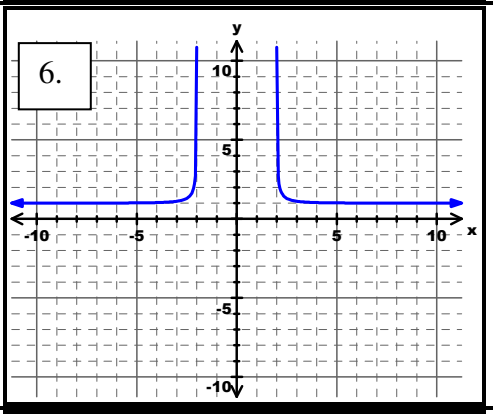
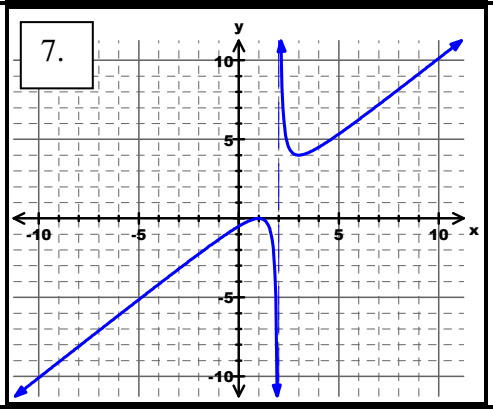
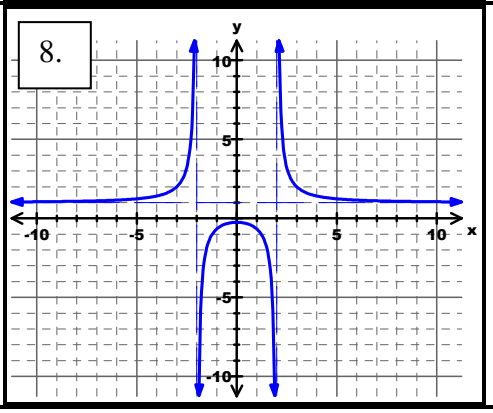


7.



8.



EQUATIONS

9. $y = \dfrac{x^2 - 4}{x^2}$	10. $y = \dfrac{x^2 - 4}{9 - x^2}$
11. $y = \dfrac{x^2}{\sqrt{x^4 - 16}}$	12. $y = \dfrac{x^2 + 4}{x^3}$
13. $y = \dfrac{x^2 - 4}{x^2 + 1}$	14. $y = \dfrac{x^3}{x^2 - 9}$
15. $y = \dfrac{x^2 + 1}{x^2 - 4}$	16. $y = \dfrac{x^2 - 2x + 1}{x - 2}$

LIMIT INFORMATION

17.

$\lim_{x \to -2^-} f(x) = +\infty$ $\lim_{x \to -2^+} f(x) = -\infty$

$\lim_{x \to 2^-} f(x) = -\infty$ $\lim_{x \to 2^+} f(x) = +\infty$

18.

$\lim_{x \to -3^-} f(x) = -\infty$ $\lim_{x \to -3^+} f(x) = +\infty$

$\lim_{x \to 3^-} f(x) = +\infty$ $\lim_{x \to 3^+} f(x) = -\infty$

19.

$\lim_{x \to +\infty} f(x) = 1$

$\lim_{x \to -\infty} f(x) = 1$

20.

$\lim_{x \to 0^-} f(x) = -\infty$

$\lim_{x \to 0^+} f(x) = +\infty$

21.

$\lim_{x \to -3^-} f(x) = -\infty$ $\lim_{x \to -3^+} f(x) = +\infty$

$\lim_{x \to 3^-} f(x) = -\infty$ $\lim_{x \to 3^+} f(x) = +\infty$

22.

$\lim_{x \to 0^-} f(x) = -\infty$ $\lim_{x \to 0^+} f(x) = -\infty$

$\lim_{x \to +\infty} f(x) = 1$ $\lim_{x \to -\infty} f(x) = 1$

23.

$\lim_{x \to -2^-} f(x) = +\infty$ $\lim_{x \to -2^+} f(x) = \textit{dne}$

$\lim_{x \to 2^-} f(x) = \textit{dne}$ $\lim_{x \to 2^+} f(x) = +\infty$

24.

$\lim_{x \to 2^-} f(x) = -\infty$

$\lim_{x \to 2^+} f(x) = +\infty$

DESCRIPTION OF FUNCTION

25. This function has a y-intercept at -.25 and three asymptotes.	26. This is an odd function with two non-removable discontinuities: one at x=-3 and one at x=3.
27. This function has a non-removable discontinuity at x=0 and $f(x) = f(-x)$.	28. This function has symmetry with respect to the y-axis. It is continuous on $(-\infty, \infty)$. Its range is $\{ y : -4 \leq y < 1 \}$.
29. This function has two non-removable discontinuities: one at x = -3 and one at x = 3.	30. For every (x, y) on the graph of $f(x)$, (-x, -y) is on the graph. This function has one non-removable discontinuity.
31. This function is: concave down on $(-\infty, 2)$ and concave up on $(2, \infty)$.	32. The domain of this function is $(-\infty, -2) \cup (2, \infty)$. The range of this function is $\{y: y > 1\}$.

WE BELONG TOGETHER LAB SHEET

Names:

_____

Class: _____ Date: _____

Complete the table to report your matches.

GRAPH	EQUATION	LIMIT INFO	DESCRIPTION
1			
2			
3			
4			
5			
6			
7			
8			

WE BELONG TOGETHER LAB SHEET

Names: _____

Answer the question(s) about each set of cards:

1. For the graph labeled # 1,

   a. find $\lim_{x \to -3} f(x)$

   b. find $\lim_{x \to 3} f(x)$

   c. identify all vertical and horizontal asymptotes.

2. For the graph labeled # 2, list the intervals on which f(x) is continuous.

3. State the domain and range of the function graphed on card # 3.

4. Identify any asymptotes of graph # 4, and determine any absolute extrema of the function.

5. Give all asymptotes of the # 5 graphed function.

6. Give all asymptotes of the # 6 graphed function.

7. For the graph on card # 7, find any relative extrema.

8. For the graph on card # 8, determine if f (x) is even, odd, or neither. Show/explain how you know.

ANSWER SHEET—WE BELONG TOGETHER

Names:

_____

Class: _____ Date: _____

Complete the table to report your matches.

GRAPH	EQUATION	LIMIT INFO	DESCRIPTION
1	10	18	29
2	14	21	26
3	9	22	27
4	13	19	28
5	12	20	30
6	11	23	32
7	16	24	31
8	15	17	25